30014

SANTA CLARA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

ENGINEER'S REPORT OF PROPOSED IMPROVEMENTS FOR GREYSTONE CREEK

ZONE C-1; THE CENTRAL ZONE

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COUNTY OF SANTA CLARA

Department of PUBLIC WORKS

JAMES B. ENOCHS - DIRECTOR OF PUBLIC WORKS

SANTA CLARA COUNTY OFFICE BLDG. • CIVIC CENTER
FIRST & ROSA STREETS, SAN JOSE, CALIFORNIA

February 24, 1961

Honorable Board of Supervisors
County of Santa Clara
20 West Rosa Street
San Jose 10, California

Gentlemen:

Transmitted herewith is the Engineer's Report on the proposed improvements for Greystone Creek, Project Number 30014 in Zone C-1 (Central Zone) of the Santa Clara County Flood Control and Water Conservation District. This report indicates the proposed improvements of 8,100 feet of channel. The estimated total cost of these facilities is $156,455. Such costs may be easily financed out of zone taxes over a period of years.

It is therefore recommended that your Honorable Board hold a public hearing on this proposed improvement as required by law.

Very truly yours,

James T. Pott

JAMES T. POTT
County Engineer

JTP:GHP:am

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ENGINEER'S REPORT

PROPOSED IMPROVEMENTS FOR ZONE C-1

PROJECT No. 30014

GREYSTONE CREEK

SANTA CLARA COUNTY FLOOD CONTROL

AND

WATER CONSERVATION DISTRICT

Donald K. Currlin
Manager-Counsel

DEPARTMENT OF PUBLIC WORKS

James B. Enochs, Director

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ENGINEER'S REPORT
FOR THE IMPROVEMENT OF GREYSTONE CREEK
PROJECT NO. 30014, ZONE C-1 (CENTRAL ZONE)

INTRODUCTION

Greystone Creek is a tributary of Alamitos Creek, which in turn is a tributary of the Guadalupe River, and is located in what is sometimes called the Almaden Valley. This is a southeasterly extension of the Santa Clara Valley located between the Los Capitancillos Ridge and the Santa Teresa Hills.

Greystone Creek has a history of flooding over only approximately the lower mile of its watershed; with this area having been always in farm land, no serious damage has resulted. However, development of this area is now rapidly expanding and has precipitated this District survey of the situation. The herein proposed improvements to the creek are recommended in order to prevent flooding of probable future development, as well as minimize costs of right of way acquirement.

This report (comprising this document and the maps and general construction plans attached hereto) shows:

1. A general description of the work proposed to be done, together with general plans, profiles, cross-sections and general specifications relating thereto, on the project constituting the improvement.

2. A general description of the land, rights of way, easements and property proposed to be taken, acquired or injured in carrying out said work.

3. Maps which show the location of the projects constituting the improvement, and land, rights of way, easements and property to be taken, acquired or injured in carrying out said work, and any information in regard to the same that is deemed necessary or useful.

4. An estimate of the cost of the project constituting the improvement in Zone C-1, which includes an estimate of the cost of land, rights of way, easements and property proposed to be taken, acquired or injured in carrying out said improvement, and also of all incidental expenses likely to be incurred in connection therewith, including legal, clerical, engineering, superintendence, inspection, printing and advertising, and the tax rates necessary to be levied to pay for the same.

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WATERSHED DESCRIPTION

Headwaters of Greystone Creek are in the Los Capitancillos Ridge, on that portion of the Ridge which lies on a line between Guadalupe Reservoir and Calero Reservoir. The two main branches of Greystone Creek join on the southwesterly side of Almaden Road and proceed north along Greystone Lane and its projection to the confluence with Alamitos Creek. The most westerly of these two branches has been termed the main branch of Greystone Creek and it is with the improvement of this branch that this report deals.

WATERSHED DEVELOPMENT

The upper reaches of the Greystone Creek watershed are so steep that high density residential development is unlikely. From approximately the 500-foot contour to Alamitos Creek, medium density residential development with scattered commercial areas has been planned by the City of San Jose, in whose sphere of influence the watershed falls. A portion of the existing Almaden Golf Course, and a partially developed residential area along the westerly boundaries of the course, lie within the Greystone Creek watershed.

The beauty of the area and existing land costs tend to encourage the construction of residences that are above the medium price class; the future development as regards schools, commercial areas, etc. will therefore be along the generally accepted lines that are supplemental to such a residential area.

BASIC CRITERIA

The criteria used in establishing preliminary design of structure, channels and grades for the Greystone Creek project are shown in the following table:

Protection Level (design storm)	
Open Channels	50-year frequency
Closed Conduits	15-year frequency
Roughness Coefficients	
Concrete Drop Structures and Culverts	n = 0.015 (Manning)
Large Reinforced Concrete Pipes	n = 0.013 (Manning)
Freeboard	
Subcritical Velocity in Earth Channel	2 feet
Supercritical Velocity through Concrete Structures	varies to contain energy grade line within channel
Maximum Velocity in Earth Channel	7.5 fps

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Peak Flow Computation
Rational Method
C = 0.40 in all potentially developable land
0.30 in hilly portions of the upper watershed
I Based on San Jose rainfall curve multiplied by a conversion factor of 1.5

Plate 1 shows the watershed area and calculated peak runoff flows at each of several key points along the various reaches of the project.

PROJECT DESCRIPTION

All open channels throughout the project are proposed to be of native earth. Because of the steep terrain it has been necessary to design channel bottoms of above-average width for the flows carried therein, which in turn are supplemented with drop structures in order to reduce flow of water to sub-erosive velocities.

In the upper reach of the project at Station 50+00 the stream branches out into two main tributaries. From this point upward it has been considered that a 15-year design will give ample protection; such design yields flows which can be contained more economically in underground conduit than in open channel, since the grade steepens to the point where such open channel would have to be concrete-lined.

In portions of the open channel work which run through existing forested areas, the right of way width has been minimized by providing for access along the channel bottom. Channel bottom access in the reach from Station 93+50 to Almaden Road is also proposed, although there are no native trees extant in this area. In designing a channel for low velocity, a bottom width was chosen which in turn provided room for maintenance access; therefore right of way width is saved through what promises to be the most valuable land in the area. There are tentative plans for commercial zoning along the westerly side of the channel in this reach, and if such comes to pass it will be possible to arrange for joint access along the delivery road in the rear of commercial buildings. In either case the right of way width shown upon the plans will be sufficient for fee ownership by the District.

Future widening of Almaden Road has been considered in planning the alignment of the south branch of Greystone Creek as well as the future culvert under Almaden Road. The existing culvert will operate with temporary sack rip-rap wing walls, until such time as the culvert is lengthened as part of the expressway project. The existing culvert under Almaden Road is ample in size but improper in alignment for future extension that will be needed when Almaden Road is widened. An 8' x 7' box culvert is proposed for the time when the entire culvert is constructed across the future 220' right of way of the Almaden Expressway.

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A temporary concrete sack rip-rap structure is proposed at the confluence with Alamitos Creek in order to allow for more complete design when the report on Alamitos Creek is prepared at a later date.

The south branch confluence will also be postponed until such time as a report is forthcoming for that area. The existing location for the south branch along the southwesterly shoulder of Almaden Road will be incorporated temporarily in its existing position.

Throughout the project economies have been effected by the use of earth channel, some channel bottom maintenance access, and resultant minimizing of right of way costs.

Staging of the Project

Present plans are to construct the reach from Station 65+00 to Station 83+50 in order to coordinate creek construction with adjacent residential development. The developer plans to carry out herein proposed construction within said reach under the terms of a reimbursible agreement.

Staging of the reach from 83+50 to Alamitos Creek will be the next phase in order to protect the existing channel from excessive erosion which will result when additional runoff is introduced from the now developing residential area.

Third stage will be the reach from Station 50+00 to 65+00 as development in that area requires.

Fourth and later stages will consist of closed conduits to be installed in future streets, which are planned to traverse the ravines containing the upper tributaries of Greystone Creek. Such installations will be made as adjacent development demands.

Supplementary Maintenance

In addition to the construction shown on the plans it may also be necessary to construct, on a maintenance basis, various erosion control facilities in several of the ravines in the upper reaches of the watershed. This will prevent high maintenance costs which follow the deposition of silt and detritus in improved downstream channels and pipes.

PROJECT COSTS

In the following table the construction costs for all stages are based on current prices. Items included in contingencies are right of way, engineering, advertising, legal fees, and all other incidentals.

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Stage No.	Station Limits of Stage	Const. Cost	Conting. Cost	Total Cost
I	65+00 to 83+50	$ 29,800	$ 5,960	$ 35,760
II	83+50 to 131+50	74,650	14,930	89,580
III	50+00 to 65+00	25,930	5,185	31,115
		$ 130,380	$ 26,075	$ 156,455

No cost estimates are presently available for the erosion control projects which may be necessary in the upper ravines of the Greystone Creek Tributaries. After the final stages of the herein proposed projects have been completed, it is recommended that needed check dams be constructed on a maintenance basis. Construction of such erosion control structures can be delayed for a few years until financing is available or until local development begins to encroach upon the check dam sites.

FINANCING

Since the Central Zone has an assessed valuation of $455,773,290, and an adequate source of revenue from existing tax assessment, it is recommended that Greystone Creek construction be staged in such a manner as to finance it on a pay-as-you-go basis from direct taxation rather than with a bond issue. Construction of the first unit of the project (stage I) will be initially financed by the adjacent developer and repayment may be financed by a tax rate of 78/100 of one cent per $100 assessed value within the zone. The upstream reaches where it is proposed to install underground conduit may be financed out of drainage fees by developers or by some other means.

CONCLUSIONS AND RECOMMENDATIONS

Historical flooding on Greystone Creek has been of a minor magnitude both in area and damage cost. However, rapidly expanding development threatens to place expensive commercial and residential structures within the potential flood path, along the lower reaches of the creek. Existing and proposed development along the upper reaches of the creek and its tributaries presents the hazard of incurring exceedingly high costs if improvement of the creek is postponed until local land development has constricted and/or infringed upon the needed channel right of way.

The proposed design of wide-bottomed earth channel permits savings in both construction costs and right of way acquisition costs, since excavation unit costs are much lower where heavy equipment has room to work, and also the wide bottom can later be used for maintenance access. Although the natural grades would cause erosive velocities the proposed wide-bottom design combined with a series of drop structures

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will reduce the water flow below erosive velocities.

Since the project is located in the Central Zone, which has a high assessed valuation, it can be constructed without a great burden upon the taxpayers, if construction is staged as proposed herein. Furthermore, the surrounding live oak covered hills and rolling terrain within the developable area lends itself to development of above-average cost residential and commercial land improvements. Such improvements will enhance land values in the area to the point where costs of the herein proposed project can easily be justified. It is therefore recommended that the Board of Supervisors hold a public hearing as required by law on this report and the accompanying plans, and that all necessary action be taken thereafter to expedite construction of the project.

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GREYSTONE CREEK
HYDROLOGIC DATA

Location	Watershed Area	Design Runoff
1. Beginning of Project, Station 50+00	258 ac.	200 cfs
2. Olive Branch Lane, Station 74+00	381 ac.	283 cfs
3. South of confluence with South Branch, Station 105+35	477 ac.	327 cfs
4. North of confluence with South Branch, Station 105+40	792 ac.	600 cfs

PLATE 1

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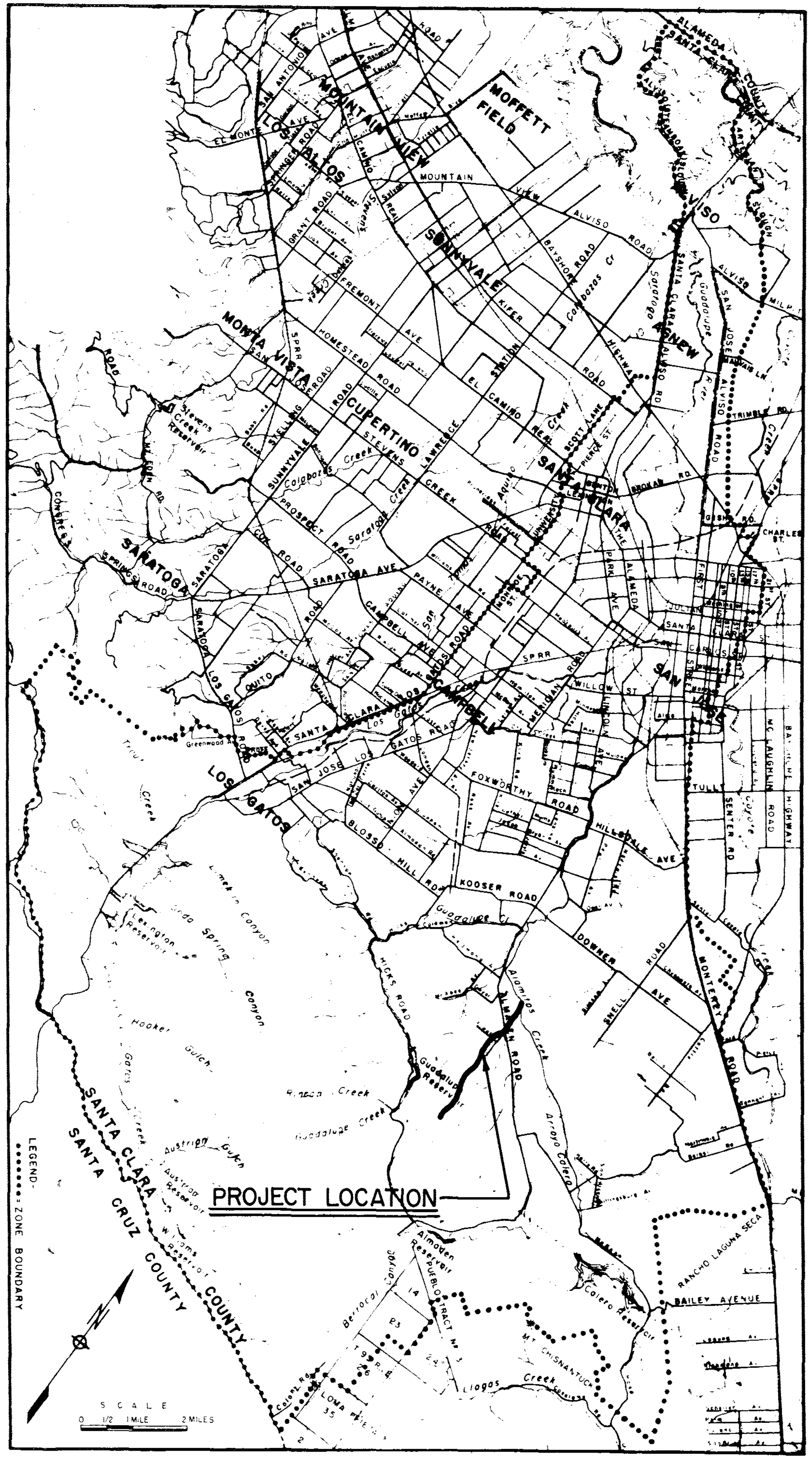

MAP AND GENERAL CONSTRUCTION PLANS

OF

ZONE C-1 (CENTRAL) PROJECT NO. 30014

GREYSTONE CREEK

FROM HEADWATERS TO ALAMITOS CREEK

SANTA CLARA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

SANTA CLARA COUNTY, CALIFORNIA

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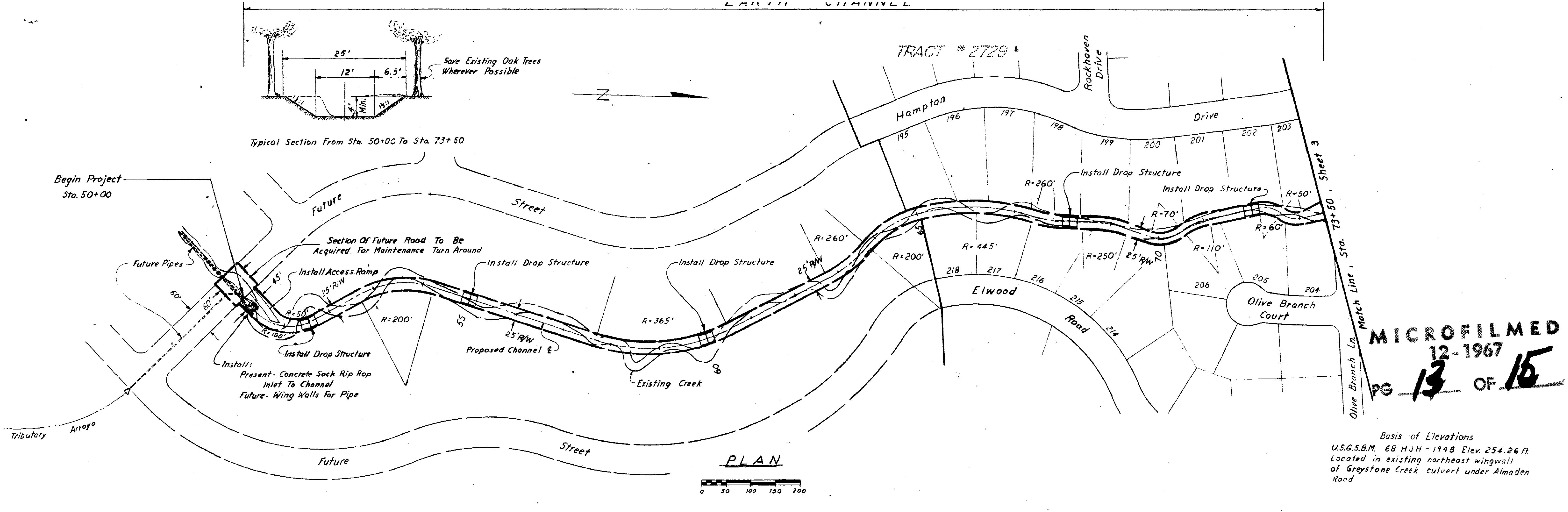

Typical Section From Sta. 50+00 To Sta. 73+50

PLAN

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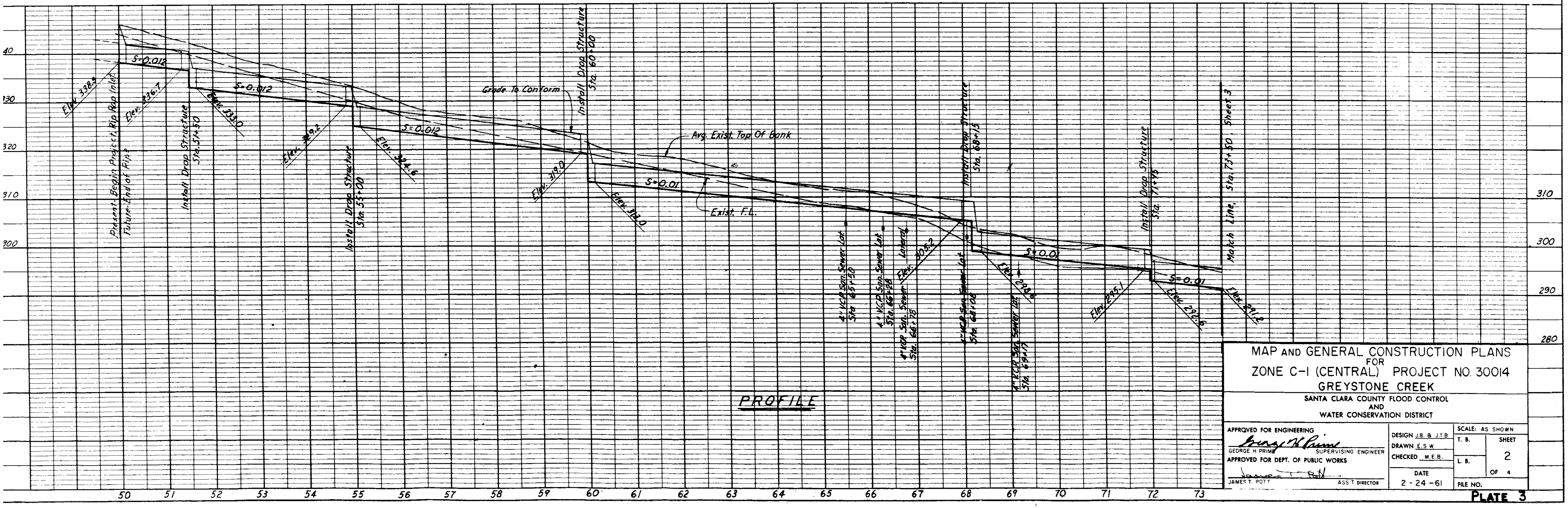
Basis of Elevations
U.S.G.S.B.M. 68 HJH-1948 Elev. 254.26 ft.
Located in existing northeast wingwall of Greystone Creek culvert under Almaden Road


40
330
320
310
300
310
300
290
280
Elev. 338.3
Present- Begin Project, Rip Rap Inlet
Future- End of Pipe
Elev. 336.7
S=0.012
Install Drop Structure Sta. 51+50
Elev. 333.0
S=0.012
Elev. 329.2
Install Drop Structure Sta. 55+00
S=0.012
Elev. 324.6
Grade To Conform
Install Drop Structure Sta. 60+00
Elev. 319.0
Elev. 314.0
S=0.01
Avg. Exist. Top Of Bank
Exist. F.L.
4" VCP San. Sewer Lat. Sta. 65+50
4" VCP San. Sewer Lat. Sta. 66+28
4" VCP San. Sewer Lateral Sta. 66+78
Elev. 305.2
4" VCP San. Sewer Lat. Sta. 68+08
Install Drop Structure Sta. 68+15
Elev. 298.6
4" VCP San. Sewer Lat. Sta. 69+17
S=0.01
Elev. 295.1
Install Drop Structure Sta. 71+95
Elev. 292.6
S=0.01
Elev. 291.2
Match Line, Sta. 73+50, Sheet 3
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PROFILE

MAP AND GENERAL CONSTRUCTION PLANS
FOR
ZONE C-1 (CENTRAL) PROJECT NO. 30014
GREYSTONE CREEK

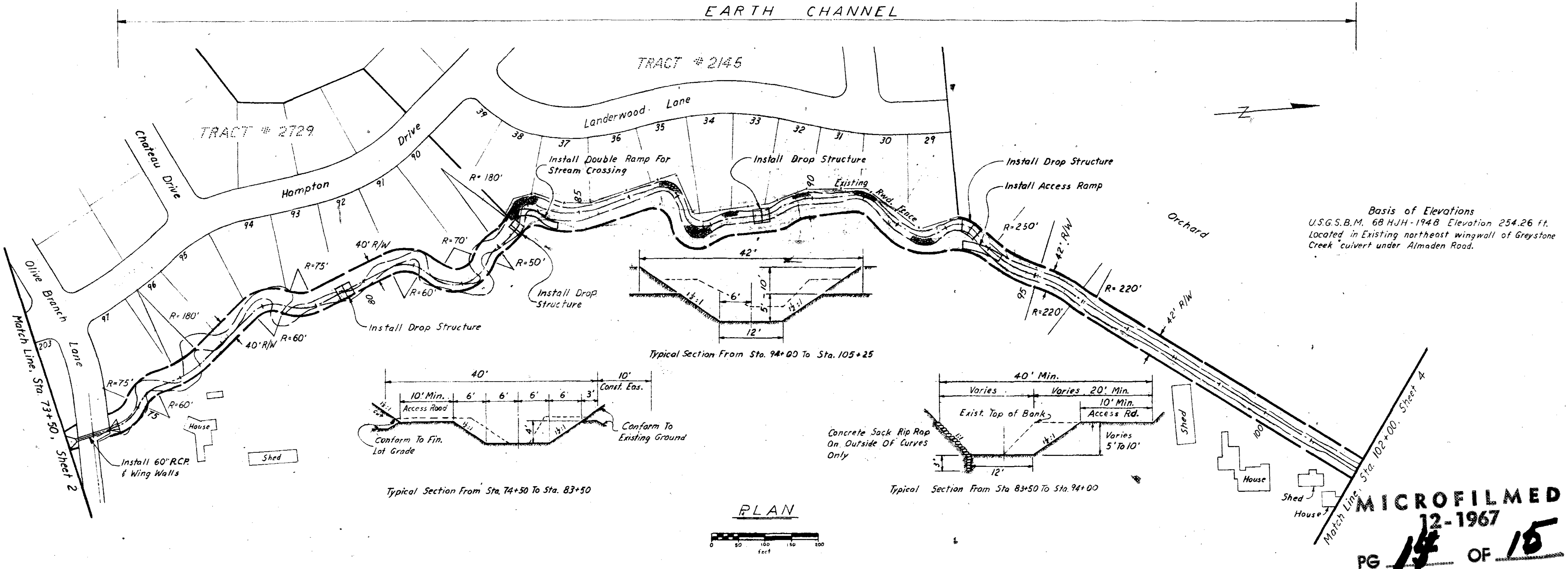
SANTA CLARA COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT

APPROVED FOR ENGINEERING
George H Prime
GEORGE H PRIME SUPERVISING ENGINEER
APPROVED FOR DEPT. OF PUBLIC WORKS
James T. Pott
JAMES T. POTT ASS'T DIRECTOR

DESIGN J.B. & J.T.B.
DRAWN E.S.W.
CHECKED M.E.B.
DATE 2-24-61

SCALE: AS SHOWN
T. B.
L. B.
SHEET 2 OF 4
FILE NO.

PLATE 3



Basis of Elevations
U.S.G.S.B.M. 68 HJH-1948 Elevation 254.26 ft.
Located in Existing northeast wingwall of Greystone Creek culvert under Almaden Road.

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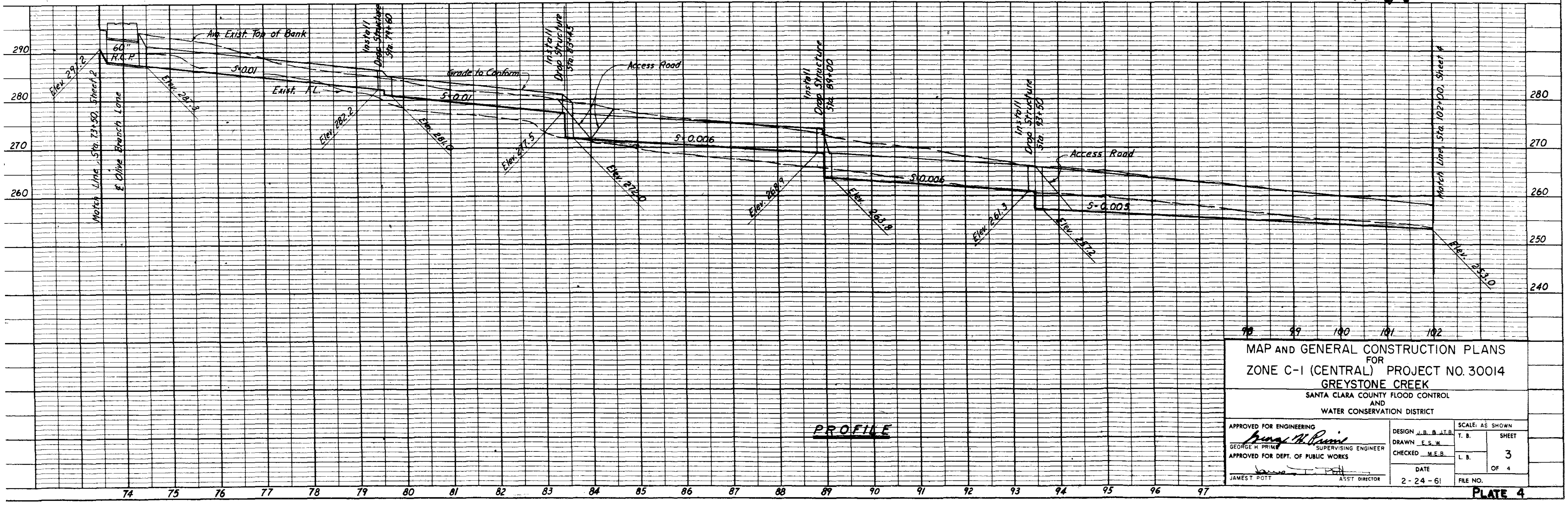


MAP AND GENERAL CONSTRUCTION PLANS
FOR
ZONE C-1 (CENTRAL) PROJECT NO. 30014
GREYSTONE CREEK

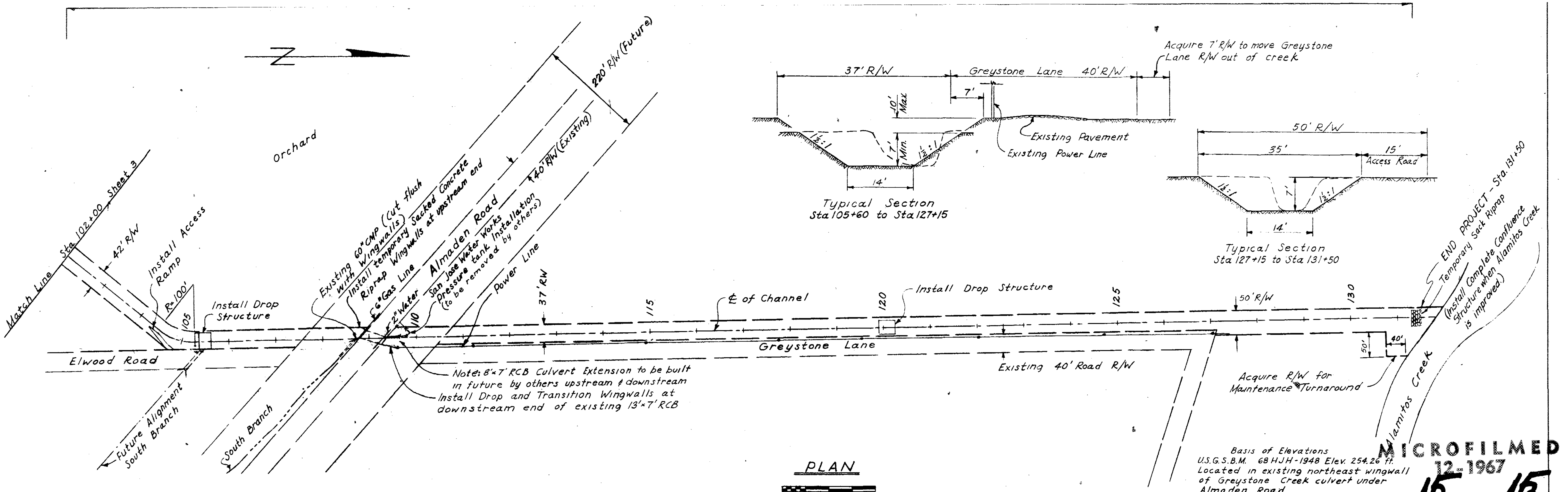
SANTA CLARA COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT

APPROVED FOR ENGINEERING
George H. Prime
GEORGE H. PRIME SUPERVISING ENGINEER
APPROVED FOR DEPT. OF PUBLIC WORKS
James T. Pott
JAMES T. POTT ASS'T DIRECTOR

DESIGN J.B. & J.T.B.
DRAWN E.S.W.
CHECKED M.E.B.
DATE 2-24-61

SCALE: AS SHOWN
T. B.
L. B.
SHEET 3 OF 4
FILE NO.

PLATE 4



220' R/W (Future)
Orchard
Match Line Sta. 102+00 Sheet 3
42' R/W
Install Access Ramp
R=100'
Install Drop Structure
Elwood Road
Future Alignment South Branch
South Branch
Existing 60" CMP (cut flush with wingwalls)
Install temporary Sacked Concrete Riprap Wingwalls at upstream end
6" Gas Line
2" Water
Almaden Road
San Jose Water Works Pressure tank installation (to be removed by others)
40' R/W (Existing)
Power Line
37' R/W
105
110
115
120
125
130
℄ of Channel
Install Drop Structure
Greystone Lane
Existing 40' Road R/W
Note: 8'×7' RCB Culvert Extension to be built in future by others upstream & downstream
Install Drop and Transition Wingwalls at downstream end of existing 13'×7' RCB
50' R/W
50'
40'
Acquire R/W for Maintenance Turnaround
Alamitos Creek
END PROJECT - Sta. 131+50
Temporary Sack Riprap
(Install Complete Confluence Structure when Alamitos Creek is improved)
37' R/W
Greystone Lane 40' R/W
Acquire 7' R/W to move Greystone Lane R/W out of creek
7'
10' Max
7' Min.
1½:1
14'
Existing Pavement
Existing Power Line
Typical Section Sta 105+60 to Sta 127+15
50' R/W
35'
15' Access Road
7'
1½:1
14'
Typical Section Sta 127+15 to Sta 131+50
0 50 100 150 200

PLAN

Basis of Elevations
U.S.G.S.B.M. 68 HJH-1948 Elev. 254.26 ft.
Located in existing northeast wingwall of Greystone Creek culvert under Almaden Road

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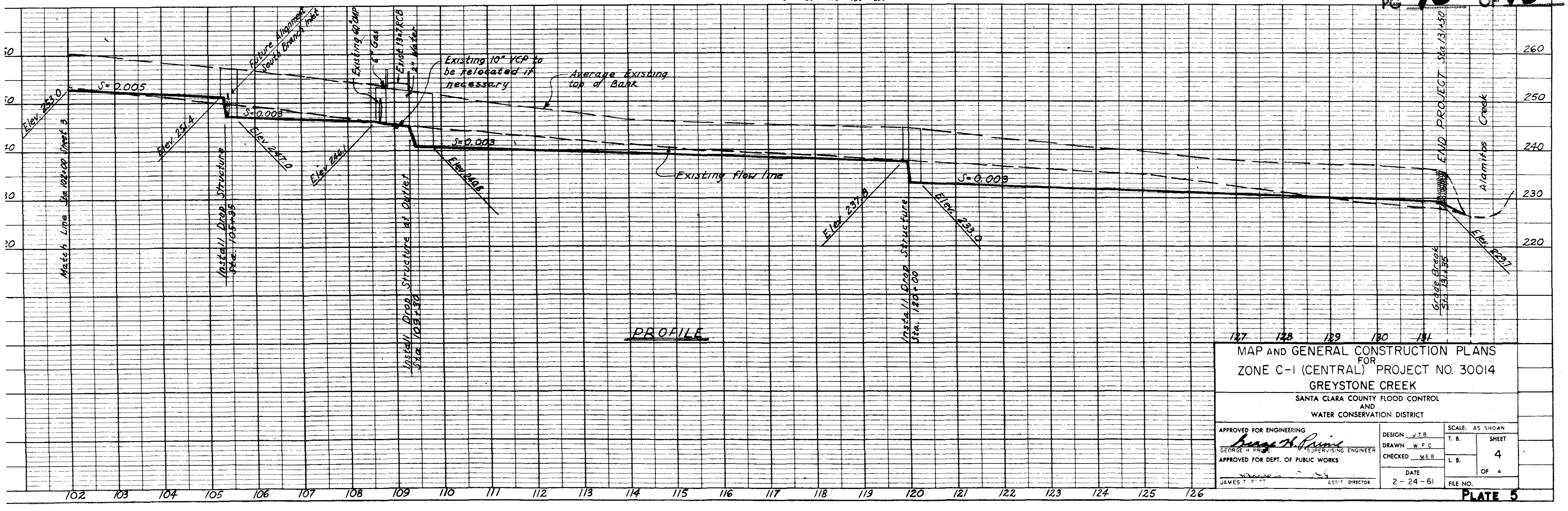

PROFILE

MAP AND GENERAL CONSTRUCTION PLANS
FOR
ZONE C-1 (CENTRAL) PROJECT NO. 30014
GREYSTONE CREEK

SANTA CLARA COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT

APPROVED FOR ENGINEERING George H. Prince GEORGE H PRINCE SUPERVISING ENGINEER	DESIGN J.T.B. DRAWN W.F.C. CHECKED M.E.B.	SCALE: AS SHOWN
APPROVED FOR DEPT. OF PUBLIC WORKS JAMES T. ... ASS'T DIRECTOR	DATE 2-24-61	T. B. L. B. SHEET 4 OF 4 FILE NO.

PLATE 5